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Title of Invention	ORGANIC ELECTROLUMINESCENCE DEVICE FOR ELIMINATINGSTATIC ELECTRICITY
Title of Invention(KPA)	ORGANIC ELECTROLUMINESCENCE DEVICE FOR ELIMINATING STATIC ELECTRICITY

Abstract(KPA)

PURPOSE: An organic electroluminescence device for eliminating static electricity is provided to protect the organic electroluminescence device from an ESD(ElectroStatic Discharge) by forming the organic electroluminescence device and a conductive discharging route around a module.

CONSTITUTION: A device layer(4) is formed on a substrate(1). A seal cover(2) is sealed by a sealing material in order to protect the device layer(4). In case that the substrate(1) or the seal cover(2) is a conductive material, a conductive discharging route(5) is connected to the substrate(1) or the seal cover(2). The conductive discharging route(5) is formed on an outside of an organic electroluminescence device and contacted to a grounding wire to discharge static electricity. A conductive pattern is formed within the substrate(1) in order to form the conductive discharging route(5).

Abstract

The present invention is to provide the organic electroluminescent display for the electrostatic discharge, and in order to discharge the static electricity generated in one side of the organic electroluminescent display in the outside or the inside of a device, the conductivity discharge channel is included as to the first electrode in which respective some extent thing is formed in the top of the substrate and the organic electroluminescent display having the seal cover in which respective organic light-emitting layer is formed in the location in which the second electrode intersects and having the light emission region and sealing the organic light-emitting layer. It simples, the discharge channel is formed the case that the substrate or the seal cover of a device is the conductivity into the conductive material and it grounds In case the substrate or the seal cover is a non-conductive. the static electricity is discharged through the conductivity discharge channel connected to the conductivity shield plate formed in one side of the substrate or the seal cover and the affect of the electrostatic discharge of the organic electroluminescent display is minimized.

Representative drawing

Fig. 1

Keyword(s)

ESD(Electrostatic Discharge)

Description

■ Brief explanation of the drawing

Figure 1 is a conceptual schematic diagram of the organic electroluminescent display for the electrostatic discharge according to the present invention.

Figs 2a through 2c are the first preferred embodiment according to the conceptual diagram of fig 1

Figure 3 is a conceptual schematic diagram of the organic electroluminescent display for the electrostatic discharge according to the present invention.

Figs 4a through 4c are the first preferred embodiment according to the conceptual diagram of fig. 3.

* The description of reference numerals of the main elements in drawings.

1, 10. substrate 2. 50: seal cover

3: sealant 4: device layer.

5: the conductivity discharge channel 5-1, and 50- 1: conductivity shield plate.

20: first electrode 30: organic light-emitting layer.

40. the second electrode 20-1, 40-1, and 70- 2: electrode line

70: conductive pattern 70- 1: contact line.

80: sealant.

■ Background Art

The present invention relates to electrostatic discharge (the Electrostatic Discharge, or less ESD) of the organic electroluminescent display.

As to the organic electroluminescent display, a drive is possible as the device which brightens while hole fade away if it injects the electric charge into the organic film formed between the electron-injecting electrode (cathode) and anode after the electronics and hole are comprised pair in the low power. It is the device in which relatively a low moreover, the power consumption is required.

Generally, as to the thickness of the organic electroluminescent display, because of being very thin to about 200nm, approximately it can be easily destroyed by the impact which is the strong electrical. The impact which is the strong electrical is caused by ESD in the electro luminescence cell. Generally, the static electricity is according to due to the rubbing and it can be easily formed. The voltage of this ESD time reaches the several thousands bolt from the thousands.

An device or the system exposed to ESD is destroyed or the performance degradation of the different form is caused. The discharge made in the form of SPARC generates EMP interfering in the wide frequency band and it causes the disturbance of a system and a system is completely destroyed and an operation impossibly makes.

Generally this ESD provides a reason including the heat breakdown, the dielectric breakdown. the metalligation melt etc. concerning

The heat breakdown (Thermal Breakdown) is the phenomenon the heat is unable to be circulated when the ESD pulse is applied and that it is concentrated and in conclusion, the Thermal Runaway is generated and the junction is shorted even if the measure current becomes the temperature coefficionce of the resistance of a teeth with the shunting (shunting).

As to the dielectric breakdown, in case the voltage hanging at the dielectric both ends is the characteristic abnormality of a dielectric, a dielectric is opened and an insulation is destroyed And the metalligation melt is the phenomenon that the temperature of a device is enhanced and a metal melts with ESD or the bonding wire falls down.

■ Technical Task

Therefore, the present invention is devised to solve the above described problems, and in a product or the system in which the organic electroluminescent display is mounted, the conductivity discharge channel is provided to the organic electroluminescent display or the module surrounding and the organic electroluminescent display is protected from ESD but the module surrounding has the purpose.

■ Structure & Operation of the Invention

The organic electroluminescent display having the seal cover in which respective organic light-emitting layer is formed in the first electrode in which respective some extent thing is formed in the top of the substrate and the location in which the second electrode intersects and having the light emission region and sealing the organic light-emitting layer the feature of the organic electroluminescent display for the electrostatic discharge according to the present invention for achieving the above described object include the conductivity discharge channel the static electricity generated in one side of the organic electroluminescent display in the outside or the inside of a device is discharged

In case the substrate or the seal cover is the conductivity, it is directly connected to the substrate or the seal cover and the conductivity discharge channel is formed outside the organic electroluminescent display

Moreover, the conductive pattern is more formed in one side of the substrate upside. In case the seal cover is the conductivity, in order to be contacted with the seal cover the conductive pattern is formed

The conductivity discharge channel is connected to the conductive pattern to the tabbed area connected to the external module for the

drive of the organic electroluminescent display and the conductivity discharge channel is formed or it is connected to the conductive yarn cover and the conductivity discharge channel is formed outside the organic electroluminescent display.

In case the substrate or the seal cover is a non-conductive, the conductivity shield plate hemming round a part of the substrate or the seal cover is formed. It is directly connected to the conductivity shield plate and the conductivity discharge channel is formed outside the organic electroluminescent display.

The conductive pattern is more formed in one side of the substrate upside. In case the seal cover is a non-conductive, the conductive pattern is formed in order to be contacted with the conductivity shield plate.

The conductivity discharge channel is connected to the conductive pattern to the tabbed area connected to the external module for the drive of the organic electroluminescent display and the conductivity discharge channel is formed or it is connected to the shield plate and the conductivity discharge channel is formed outside the organic electroluminescent display

The action according to the characteristic of the present invention provides the conductivity discharge channel for the inside or the outside of the organic electroluminescent display and it simples, it forms the discharge channel into the conductive material and the case that the substrate or the seal cover is the conductivity grounds Since in case the substrate or the seal cover is a non-conductive, the substrate is connected to the conductivity shield plate formed in one side of the substrate or the seal cover and it is gone the static electricity through the conductivity discharge channel connected to the shield plate it can minimize the affect of the electrostatic discharge of the organic electroluminescent display.

Another object of the present invention, and a characteristic and advantages will become clear through detailed description of the embodiment referring to the drawing attached.

It is as follows: referring to the figure if it illustrates for preferred embodiment of the organic electroluminescent display for the electrostatic discharge.

The first preferred embodiment

Figure 1 is a conceptual schematic diagram of the organic electroluminescent display for the electrostatic discharge according to the present invention

As shown in Figure 1, in case the device layer (4), formed on the substrate (1) and the seal cover (2), which the organic electroluminescent display seals with the sealant (3) in order to protect the device layer (4) and substrate (1) or the seal cover (2) are the conductivity, it is comprised of the conductivity discharge channel (5) connected to the substrate (1) or the seal cover (2).

As shown in Figure 1, the proper method for protecting the organic electroluminescent display from electrostatic discharge (hereinafter, ESD) provides the conductivity discharge channel (5) to the organic electroluminescent display surrounding and it quickly disperses the static electricity.

As shown in Figure 1, if the organic electroluminescent display is grounded in order to quickly disperse the static electricity, it is simple, the road in which or the electric charge can move to the earth from an earth is provided.

Figs. 2a through 2c shows figs 2b and 2c is one end direction according to the I-I' direction of respective drawing 2a the drawing 2a is the plane view of the organic electroluminescent display for the electrostatic discharge to the first preferred embodiment according to the conceptual diagram of fig. 1.

As shown in figs. 2a through 2c, the organic electroluminescent display having the seal cover (50) in which respective organic light-emitting layer (30) is formed in the first electrode (20) in which respective some extent thing is formed on the substrate (10) and the location in which the second electrode (40) intersects and having the light emission region and which is the organic light-emitting layer (30) sealed with the sealant (80) include the conductivity discharge channel which is connected to one side of the organic electroluminescent display for the electrostatic discharge generated in the outside or the inside of a device to the seal cover (50) in case the seal cover (50) is the conductivity and discharges the static electricity through the ground.

And the conductivity discharge channel is directly connected to the conductive yarn cover (50) and as shown in Figure 1, the conductivity discharge channel is formed outside the organic electroluminescent display. And it contacts the conductivity discharge channel in the earthing conductor and it discharges the static electricity. In this way, the static electricity which does, flows through the surface of the substrate (10) of the conductivity or the seal cover (50) is removed to the ground.

In case the static electricity is discharged to the conductive yarn cover (50). as described above, it is simple, the conductivity discharge channel is formed into the conductive material and it contacts the earthing conductor.

Moreover, in case the substrate (10) is the conductivity, it is directly connected and the conductivity discharge channel is formed in the substrate (10) outside the organic electroluminescent display. And the conductivity discharge channel is contacted in the earthing conductor and the static electricity is discharged.

And if the conductivity discharge channel is formed and the conductive pattern (70) is formed inside the substrate (10) and the conductivity discharge channel is made, it is more effective The discharge channel is formed so that the pattern composed of the conductive material which is not contacted in the predetermined domain on the substrate (10) with the electrode of a device is taken shape and the pattern be connected to the tap (tab) domain to the conductive pattern, or the static electricity generated through the

extension discharge channel which as shown in Figure 1, is directly connected to the conductive yarn cover (50) to the outside of element in the substrate (10) is released to an outside In other words.

Therefore, the conductive pattern (70) is formed so that a part be contacted with the conductive yarn cover (50) by forming a part of the conductive yarn cover (50) on one side of the substrate (10) top In order to be protruded and at this time, the partial sealing part and domain are shared at least and the conductive pattern (70) is formed

And the conductive pattern (70) releases the static electricity generated after the route of the extension conductivity discharge channel which is formed in the partial domain of a substrate in order to be electrically contacted and is connected to the conductive pattern (70) and is connected to the conductive yarn cover (50), and the ground and conductive yarn cover (50) from the substrate (10) to an outside.

And the conductive pattern (70) releases the static electricity generated through the conductive yarn cover (50) and the discharge channel which is roomily formed in the edge of the substrate upside in order to be electrically contacted and is formed in the tap (tab) domain and as shown in Figure 1, it is connected as the conductivity discharge channel connected to the ground to the seal cover (70) and is formed outside the organic electroluminescent display from the substrate (10) to an outside

For example, in order not to be contacted in the tap (tab) domain for electrically connecting electrodes (20, 40) of a device and electrode lines (20-1, 40-1) connected to the external module of the organic electroluminescent display with electrodes (20, 40) of a device the conductive pattern (70) is formed And the conductivity discharge channel composed of the line (70-2) connected to one side of electrode lines (20-1, 40-1) which are connected to the contact line (70-1) connected to the conductive pattern (70) and are connected to the external module to the contact line (70-1) is formed. It is the conductivity discharge channel connected to the ground and the static electricity is rapidly discharged.

The drawing 2c is comprised identically with the drawing 2b It more forms the auxiliary electrode (90) on the fixed domain on upside of the sealant (80) and the first electrode (20) fixed domain on upside.

The second preferred embodiment

Figure 3 is a conceptual schematic diagram of the organic electroluminescent display for the electrostatic discharge according to the present invention.

As shown in Figure 3, in case the device layer (4), formed on the substrate (1) and the seal cover (2), which the organic electroluminescent display seals with the sealant (3) in order to protect the device layer (4) and substrate (1) or the seal cover (2) are the non-conductive, it is connected to the conductivity shield plate (5-1) hemming round a part of the substrate (1) or the seal cover (2) and it is comprised of the conductivity discharge channel (5) connected to the conductivity shield plate (5-1).

The conductivity discharge channel (5) is formed in the tabbed area connected to the external module for the drive of the organic electroluminescent display or as shown in the figure, in order to be electrically connected to the substrate (1) or the seal cover (2) it is formed outside the organic electroluminescent display

As shown in Figure 3, if the organic electroluminescent display is grounded in order to provide the conductivity discharge channel (5) to the organic electroluminescent display surrounding and quickly disperse the static electricity, it is simple, the road in which or the electric charge can move to the earth from an earth is provided.

Figs. 4a through 4c shows figs 4b and 4c is one end direction according to the II-II' direction of respective drawing 4a the drawing 4a is the plane view of the electrostatic discharge organic electroluminescent display to the first preferred embodiment according to the conceptual diagram of fig. 3

As shown in figs. 2a through 2c, in case the substrate (10) or the seal cover (50) is a non-conductive as to the first electrode (20) in which respective some extent thing is formed on the substrate (10) and the organic electroluminescent display in which respective organic light-emitting layer (30) is formed in the location in which the second electrode (40) intersects and having the light emission region and having the seal cover (50) which seals the organic light-emitting layer (30) with the sealant (80), it is comprised of the conductivity discharge channel which is connected to the conductivity shield plate (50-1) hemming round a part of the substrate or the seal cover and is connected to the conductivity shield plate (50-1) and earthed discharges the static electricity flowing through the non-conductive substrate or the seal cover.

The organic electroluminescent display was worn to the shield plate (50-1) of the conductivity so that the seal cover (50) flow the organic electroluminescent display side in the electrostatic discharge in case the substrate (10) or the seal cover (50) was a non-conductive. In this way, the static electricity which does, flows through the surface of the substrate (10) of the non-conductive or the seal cover (50) is removed to the ground.

The conductivity discharge channel is connected to the conductivity shield plate (50-1) and as shown in Figure 3, the conductivity discharge channel is formed outside the organic electroluminescent display. In case the static electricity is discharged to the seal cover (50), as described above, it is simple, it forms the shield plate (50-1) and conductivity discharge channel into the conductive material and conductivity discharge channel contact the earthing conductor.

Moreover, the conductivity shield plate (50-1) is formed on one side of the substrate (10) in case the substrate (10) is a non-conductive. In order to be connected to the conductivity shield plate (50-1) it forms outside the organic electroluminescent display and the conductivity discharge channel contacts the earthing conductor.

And if the conductivity discharge channel is formed and the conductive pattern (70) is formed inside the substrate (10) and the conductivity discharge channel is made, it is more effective. The discharge channel is formed so that the pattern composed of the conductive material which is not contacted in the predetermined domain on the substrate (10) with the electrode of a device is taken shape and the pattern be connected to the tap (tab) domain to the conductive pattern, or the static electricity generated through the extension discharge channel which as shown in Figure 3, is directly connected to the conductivity shield plate (50-1) to the outside of element in the substrate (10) is released to an outside in other words.

Therefore, the conductive pattern (70) is formed in order to be contacted in one side of the substrate (10) top with the conductivity shield plate (50-1). And at this time, the partial sealing part and domain are shared at least and the conductive pattern (70) is formed.

And as to the conductive pattern (70), in order to be electrically contacted with the conductivity shield plate (50-1) it is formed in the partial domain of a substrate and the partial domain releases the static electricity generated after the conductive pattern (70), and conductivity shield plate (50), and the route of the conductivity discharge channel from the substrate (10) to an outside.

And the conductive pattern (70) releases the static electricity generated through the conductivity shield plate (50-1) and other discharge channel which is roomily formed in the edge of the substrate upside in order to be electrically contacted and is formed in the tap (tab) domain and as shown in Figure 3, it is connected as the conductivity discharge channel connected to the ground to the shield plate (50-1) and is formed outside the organic electroluminescent display from the substrate (10) to an outside.

For example, in order not to be contacted in the tap (tab) domain for electrically connecting electrodes (20, 40) of a device and electrode lines (20-1, 40-1) connected to the external module of the organic electroluminescent display with electrodes (20, 40) of a device the conductive pattern (70) is formed. And the conductivity discharge channel composed of the line (70-2) connected to one side of electrode lines (20-1, 40-1) which are connected to the contact line (70-1) connected to the conductive pattern (70) and are connected to the external module to the contact line (70-1) is formed. It is the conductivity discharge channel connected to the ground and the static electricity is rapidly discharged

The drawing 4c is comprised identically with the drawing 4b It more forms the auxiliary electrode (90) on the fixed domain on upside of the sealant (80) and the first electrode (20) fixed domain on upside.

■ Effects of the Invention

The organic electroluminescent display for the electrostatic discharge according to present invention described in the above has effect as follows

Simple, the discharge channel is formed the case that the substrate or the seal cover of a device is the conductivity into the conductive material and it grounds. Since in case the substrate or the seal cover is a non-conductive, the substrate is connected to the conductivity shield plate formed in one side of the substrate or the seal cover and it is gone the static electricity through the conductivity discharge channel connected to the shield plate the affect of the electrostatic discharge of the organic electroluminescent display is minimized.

Moreover, the conductive pattern is more formed on the top of a substrate and it contacts and forms the conductive yarn cover or the conductivity shield plate. By the conductivity discharge channel connected to the conductive pattern being together formed on the tabbed area with the external module for the drive of a device and being gone the static electricity the affect of the electrostatic discharge of the organic electroluminescent display is minimized

As illustrated in the above, it will be able to know at the range that does not break away from technical spirit of the present invention if it is the person skilled in the art that a change and the various correction are possible.

Therefore, technical scope of the present invention is not restricted to the written in a preferred embodiment content but it determines by the range of the patent claim

Scope of Claims

■ Claim 1.

The organic electroluminescent display having the seal cover in which respective organic light-emitting layer is formed in the location in which the first electrode and the second electrode intersect and having the light emission region and sealing the organic light-emitting layer that respective some extent thing is formed in the top of the substrate, said organic electroluminescent display having the seal cover in which respective organic light-emitting layer is formed in the location in which the first electrode and the second electrode intersect and having the light emission region and sealing the organic light-emitting layer are comprised of the conductivity discharge channel which is earthed in order to discharge the static electricity generated in one side of the organic electroluminescent display in the outside or the inside of a device.

■ Claim 2:

The organic electroluminescent display for the electrostatic discharge of claim 1, wherein the conductivity discharge channel the substrate or the seal cover is the conductivity is directly connected to the substrate or the seal cover and it is formed outside the organic electroluminescent display.

■ Claim 3·

The organic electroluminescent display for the electrostatic discharge of claim 2, wherein the conductive pattern the seal cover is the conductivity the conductive pattern is more formed in one side of the substrate upside is formed in order to be contacted with the seal cover.

■ Claim 4:

The organic electroluminescent display for the electrostatic discharge of claim 2, wherein the conductivity discharge channel is connected to the conductive pattern to the tabbed area connected to the external module for the drive of the organic electroluminescent display and it is formed or it is connected to the conductive yarn cover and it is formed outside the organic electroluminescent display.

■ Claim 5:

The organic electroluminescent display for the electrostatic discharge of claim 1, wherein the conductivity discharge channel the conductivity shield plate hemming round a part of the substrate or the seal cover is formed the substrate or the seal cover is a non-conductive is directly connected to the conductivity shield plate and it is formed outside the organic electroluminescent display.

■ Claim 6:

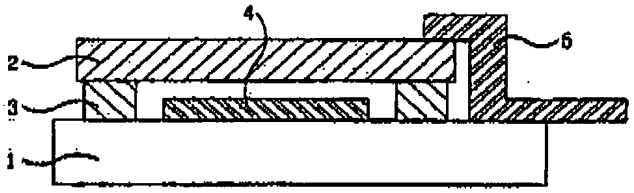
The organic electroluminescent display for the electrostatic discharge of claim 5, wherein the conductive pattern the substrate or the seal cover is a non-conductive the conductive pattern is more formed in one side of the substrate upside is formed in order to be contacted with the conductivity shield plate.

■ Claim 7:

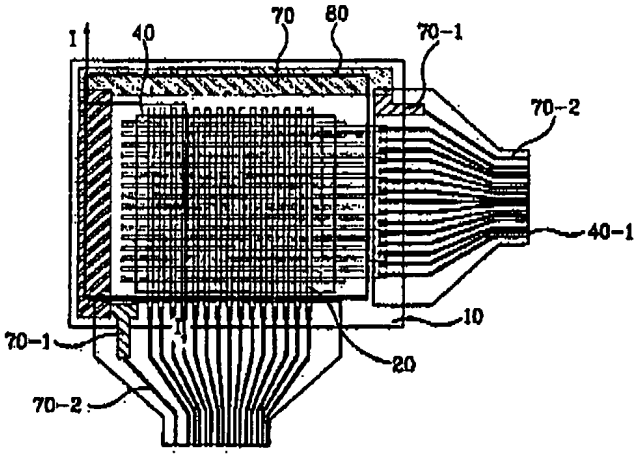
The organic electroluminescent display for the electrostatic discharge of claim 5, wherein the conductivity discharge channel is connected to the conductive pattern to the tabbed area connected to the external module for the drive of the organic electroluminescent display and it is formed or it is connected to the shield plate and it is formed outside the organic electroluminescent display

Drawing

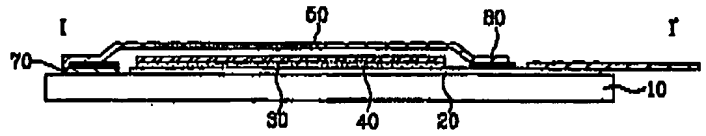
■ Fig. 1



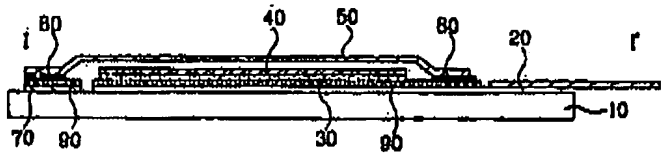
■ Fig. 2a



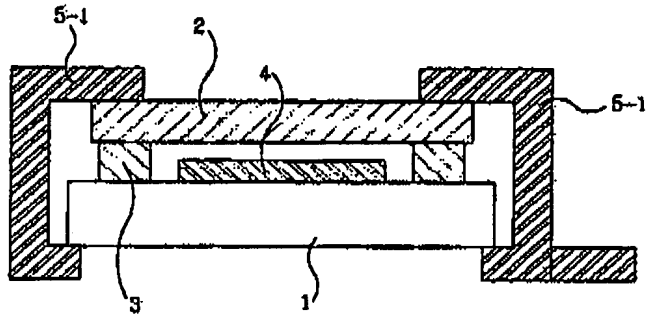
■ Fig. 2b



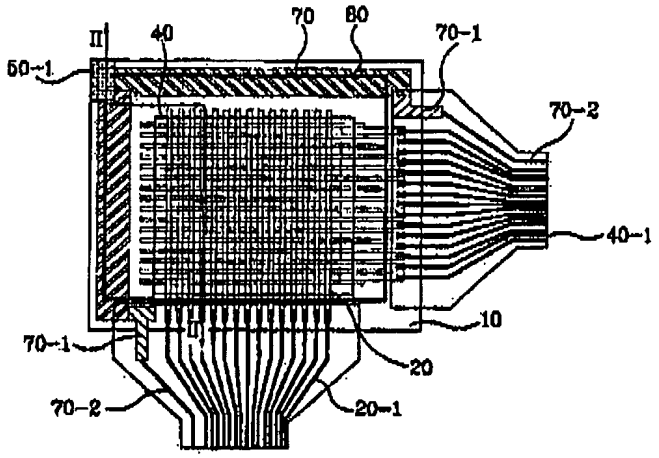
■ Fig. 2c



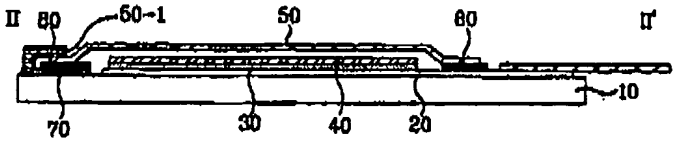
■ Fig. 3



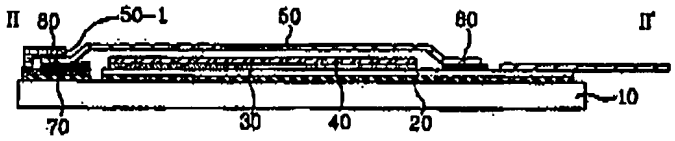
■ Fig. 4a



■ Fig. 4b



■ Fig. 4c



Legal Status

Date	Type of Document	Status
20010910	Patent Application	Received
20031013	Notice of Submission of Opinion	Delivery Completed
20031212	Request for Extension of Designated Period	Received
20040113	Amendment including Specification etc	Received
20040113	Written Opinion	Received
20040429	Notice of Submission of Opinion	Delivery Completed
20040622	Amendment including Specification etc	Received
20040622	Written Opinion	Received
20041230	Written Decision on Registration	Delivery Completed